Amendments to the Specification

Please delete the following text from page 1:

~~**Related Applications**~~

~~No other applications relate~~

Please replace the paragraph spanning pages 1 and 2 with the following rewritten paragraph:

In security printing, it is common to add special authentication materials to the ink and paper used in order to be able to detect them later, thus verifying ~~that it is a legitimate copy~~ the authenticity of a printed article. The most common materials used for such authentication are fluorescent materials, magnetic materials, specialty tagging materials, biological materials (such as DNA) and others. Since these authentication materials are typically mixed with the ink (or paper), a rather large amount (from 0.1 volume% to 10 volume%) of authentication material has to be used in order to make detection easy in the presence of all the impurities of the paper and ink. It is also generally desired that the detection equipment ~~will~~ be portable and inexpensive, ~~therefore~~ making it even more desirable to mix authentication materials with ink in large concentrations ~~of material are needed~~. Mixing ~~the~~ authentication ~~material~~ materials with ~~the~~ ink has some major disadvantages. Firstly, large amounts of authentication material are needed. ~~Besides~~ In addition to being costly, ~~this~~ the use of large amounts of authentication material makes it easy for counterfeiters to analyze printed samples to identify the authentication material. Secondly, since there are many types of inks used, inventory management is expensive. Furthermore, when a particular authentication material becomes obsolete, a large inventory of ink has to be discarded.

Please delete the first full paragraph on page 2.

Please add the following paragraph immediately after the end of the text on page 2:

There is a general desire to provide improved methods for applying authentication material to printed articles that overcome or at least ameliorate some of the aforementioned disadvantages.

Please replace the first full paragraph on page 3 with the following rewritten paragraph:

The invention uses the spray powder dispenser (also known as the anti-offset powder dispenser) installed in most printing presses to dispense an authentication material, which is mixed with the spray powder. The authentication material, in powder form, sticks to the surface of the wet printing ink. As the ink cures, the authentication material is permanently bonded to the surface. This allows the authentication material to be employed in the authentication of documents. Because the authentication material is on top of the ink, not mixed with it, a ~~very~~ relatively small amount of authentication material is required in comparison to prior art techniques where the authentication material is mixed with the ink. The method of the present invention is compatible with printing methods such as lithography (both wet and waterless), flexography, gravure, intaglio, ink-jet and xerography.

Please delete the following text from page 3:

~~No drawings pertain to the present invention~~

Please add the following paragraph immediately after the end of the text on page 3:

Figure 1 is a schematic depiction of a method for adding authentication material to printed articles according to a particular embodiment of the invention.

Please replace the first full paragraph on page 4 with the following rewritten paragraph:

In many applications, it is desirable to add an authentication material to the ink used in printing in order to detect counterfeit goods. Examples ~~are~~ where authentication materials are used in this manner include: currencies, stock certificates, boxes of various goods, labels, tickets and many more. Currently ~~this~~ the addition of authentication material is achieved by mixing an authentication material with at least one of the inks used or by adding an overprint using a special ink, typically a fluorescent ink. Such an overprint can be detected under UV light. Since the ink contaminates and obscures the authentication material, large concentrations of authentication material are needed, typically from 0.1 volume% to 10 volume%. This greatly increases the cost of the ink. Overprinting with an invisible ink also significantly increases costs and is easy to duplicate. Because of the very high viscosity of most printing inks, which are more like pastes, mixing of ink and authentication material has to be done at the factory and special inventory of ink mixed with authentication material has to be carried by the printer.

Please replace the paragraph spanning pages 3 and 4 with the following rewritten paragraph:

Almost all sheet fed printing presses, as well as some other printing presses, use a powder dispensing system to prevent the wet ink on one press sheet from sticking to the back of ~~the~~ an adjacent sheet. The sticking problem is even more severe with two-sided printing. Such powder dispensing systems are known in the trade as "spray powder" systems or "anti-offset powder" systems. These systems are available from all major printing press manufacturers, such as Heidelberg, MAN-Roland, Komori, KBA, Ryobi, Hamada, AB Dick and others. ~~The~~ Printing presses are normally supplied with the spray powder system installed as part of the press. For printing presses not equipped with such a system, such as web presses or flexographic presses, a stand-alone spray powder system can be easily added. Such stand-alone spray powder systems are available from vendors such as Grafix (Stuttgart,

Germany), Oxy-Dry (www.oxydry.com), Airtech (www.airtech.com) and others. The powders employed in these spray powder systems are typically made of materials such as starch, with particle sizes from about 20µm to 50µm. ~~, the coarser~~ Coarser powders are generally used for thicker papers and heavier ink coverage. Powders are available from Oxy-Dry, Varn and many other vendors. Typical coverage employed by spray powder systems is about 30mg per square meter of printed material. Some of the applied powder adheres to the ink, which is not fully cured and is permanently trapped by the ink when it cures. The term "cure" should be ~~read to cover~~ understood to include all mechanisms of ink becoming solid, such as drying, cross-linking, UV curing etc. As the process of spray powder coating is well-known to practitioners in the field of printing, it will not be further described herein.

Please replace the paragraph spanning pages 5 and 6 with the following rewritten paragraph:

The inventors have discovered that mixing an authentication material with ~~the~~ a spray powder constitutes an unexpectedly good way of distributing the authentication material for the following reasons:

a. The same authentication-material-containing powder can be used with all inks and papers, simplifying logistics.
b. Since the authentication-material-containing powder does not mix with the ink but sticks to the top layer, the authentication material is not contaminated by the ink. This greatly reduces the amount of authentication material needed for reliable detection. Concentrations as low as one part per million can be detected.
c. Since the concentration of the authentication material is low, it is difficult for counterfeiters to establish the composition of the authentication material via chemical analysis of the ink and paper. Ink and paper contain many impurities at much higher concentrations ~~then~~ than that of the authentication material. At the same time detection is easy with the proper detection unit, as it looks only at the top surface of the ink where concentration of authentication material is higher.

d. Authentication materials have to be periodically changed for increased security. ~~A spray powder changeover is vastly simpler than an ink changeover as~~ Changing a spray powder within a printing system is significantly simpler than changing the ink used in a printing system because no pre-wash-up is required.

Please replace the first full paragraph on page 6 with the following rewritten paragraph:

The authentication material used in accordance with the present invention can be one or more of the many authentication materials in commercial use at this time. It is desirable to use a particle size ~~matching~~ that substantially matches that of the spray powder, i.e. from 20µm to 50µm but powders as fine as 5µm can be used. The invention is not limited to any particular type of authentication material. The invention can be used with any of the well-known authentication materials used today, as long as the material is available in powder form.

Please replace the paragraph spanning pages 6 and 7 with the following rewritten paragraph:

Some examples of such authentication materials include:

~~1~~ a. Magnetic powders, such as ferrite or Fe2O3. The presence of the magnetic powder is detected by magnetizing and passing a pick-up coil over the printed sample.

~~2~~ b. Fluorescent powders. The presence of the fluorescent powder is detected under UV light ("black light").

~~3~~ c. Biological powders, such as DNA containing powder. These biological powders give a very high level of security, due to the difficulty of analyzing the material, at the expense of cost of the detection equipment.

~~4~~ d. Radio frequency absorbing powders. ~~There~~ These radio frequency absorbing powders are detected by a unique absorption signature, typically in the microwave region.

~~5~~ e. Micro tagging powders. These powders are made by shredding a multi-layered material and microscopically identifying the fine shreds under very high magnification.

Please add the following paragraph immediately prior to the first full paragraph on page 7:

Figure 1 schematically depicts a method **100** for adding authentication material to printed articles according to a particular embodiment of the invention. In block **110**, authentication material is mixed with spray powder. In block **120**, ink is applied to a printed article. The application of ink in block **120** may occur in accordance with any printing process where wet ink is applied to a printed article and is then subsequently cured. In block **130**, the powder mixture, which comprises spray powder and authentication material, is applied to the printed article. The powder mixture applied to the printed article in block **130** adheres to the surface of the wet ink. In block **140**, the wet ink is cured. As the ink cures in block **140**, the powder mixture applied to the ink becomes bonded to the surface of the ink.

Please replace the first full paragraph on page 7 with the following rewritten paragraph:

By way of example, a mixture containing 1 volume% fluorescent powder, UVXPBR from MaxMax (www.maxmax.com) and 99 volume% spray powder #C-230 from Varn (www.varn.com) was applied to freshly printed sheet using a Grafix Model Alphametrics 200 system, made by Grafix (Stuttgart, ~~germany~~ Germany), and mounted on a Heidelberg SM74 press. The total powder mixture density was about 30mg per square meter, thus the concentration of the fluorescent authentication material was only ~~0.3milligram~~ 0.3mg per square meter. After 24 hours, when the ink on the sheets ~~were~~ was dry, the presence of the authentication material was detected (in a dark room) with a 375nm UV flashlight (flashUV2 from www.maxmax.com). In this test, the concentration of the ~~active~~ authentication material was about 100 parts per million relative to the ink.